

(12) **UK Patent Application** (19) **GB** (11) **2 197 267** (13) **A**

(43) Application published 18 May 1988

(21) Application No 8725028

(22) Date of filing 26 Oct 1987

(30) Priority data

(31) 3639195

(32) 15 Nov 1986

(33) DE

(71) Applicant

Daimler-Benz Aktiengesellschaft

(Incorporated in FR Germany)

Stuttgart-Unterturkheim, Federal Republic of Germany

(72) Inventors

Wolfgang Klie

Wolfgang Fischer

Johann Tomforde

Horst Kleiner

Gunter Ellenrieder

(74) Agent and/or Address for Service

Jensen & Son,

8 Fulwood Place, High Holborn, London WC1V 6HG

(51) INT CL<sup>4</sup>

B60R 19/22 21/34

(52) Domestic classification (Edition J):

B7B 5EB

(56) Documents cited

GB A 2098553

GB 1572110

DE OS 3325104

GB A 2018944

EP A1 0050722

(58) Field of search

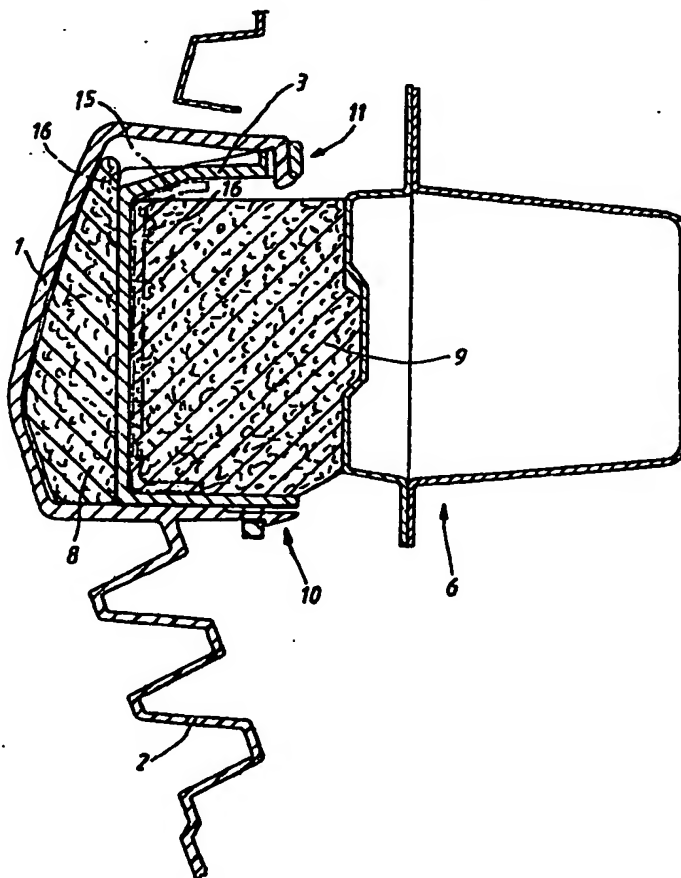
B7B

Selected US specifications from IPC sub-class B60R

(54) A bumper for a motor vehicle

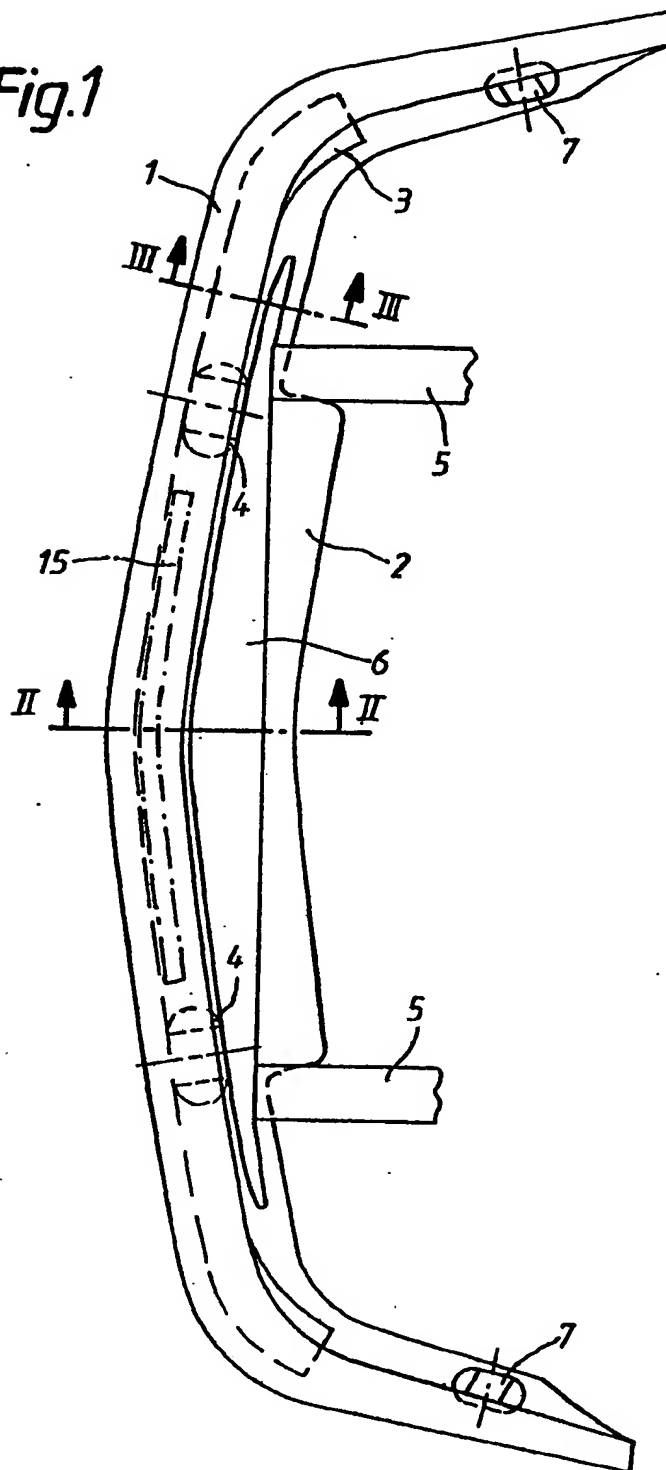
(57) A support part (3) separates an impact-near and an impact-remote layer of energy-absorbent foam (8,9) from each other and is supported by means of resilient holders on a support (6) fixed to the vehicle chassis, to which support part (3) a panelling (1) covering the front of the impact-near layer (8) is fixed and to which a downwardly extending skirt (2) adjoins. In order to increase the absorbency and retain a pedestrian-protective configuration, the support part (3) is designed as a rigid load distributing support and the panelling fastened thereto merges integrally with the skirt.

Fig.2



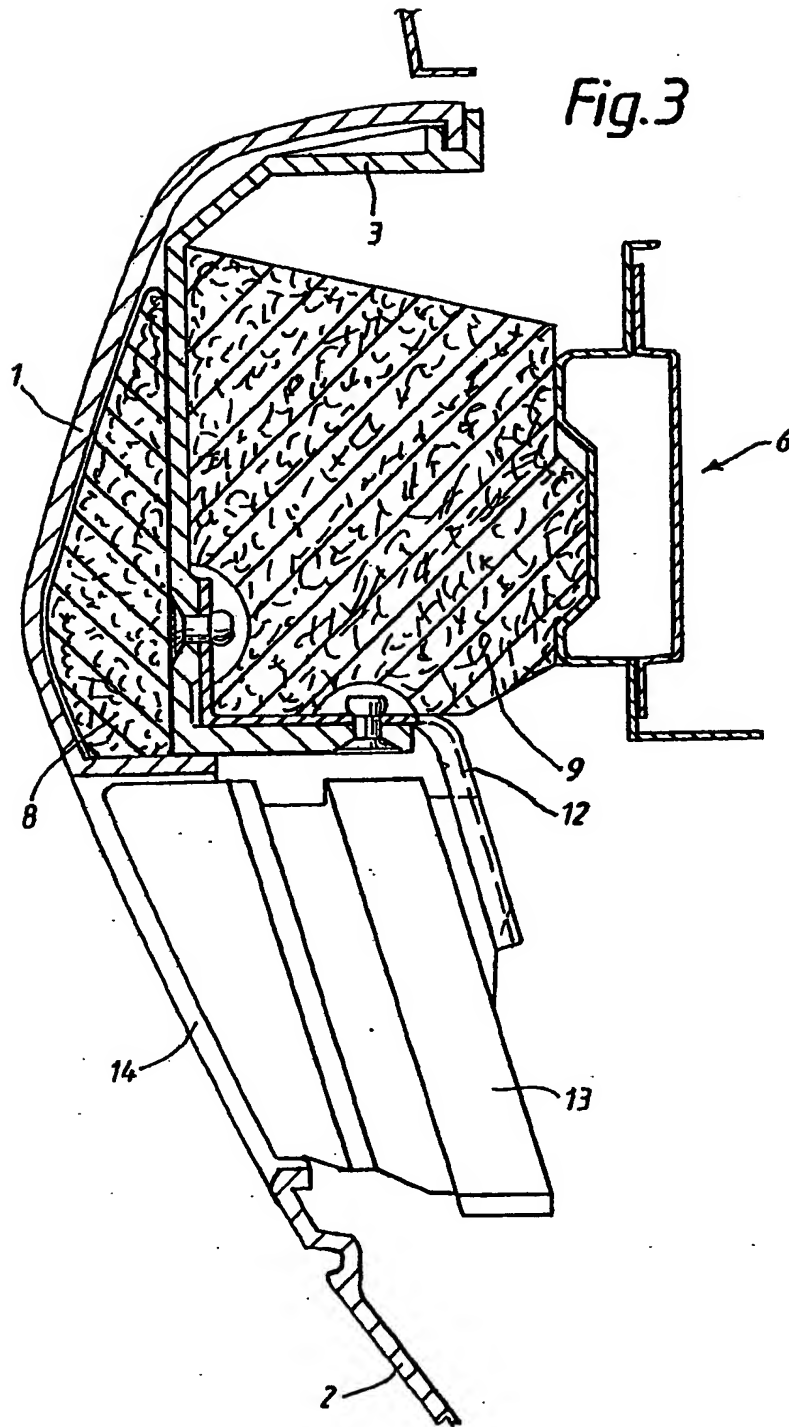
GB 2 197 267 A

Fig.1





2197267



## SPECIFICATION

## A bumper for a motor vehicle

- 5 The invention relates to a bumper for a motor vehicle comprising an impact-near and an impact-remote layer with a support part separating the layers from each other and supporting said layers by means of resilient holders on a support fixed to the vehicle, each of the layers consisting of an energy-absorbing foam, the support part having a panelling covering the front of the impact-near layer fixed thereto and to the lower side of which a skirt adjoins.
- 10 Such a bumper arrangement is known from German Offenlegungsschrift OS. 3, 325, 104. As in this case the support is continued above and below the foam layer as covering and skirt respectively, and these continuations have to yield resiliently when impacted, e.g. by a obstacle, close limits are set for the support strength. Therefore, in the case of a relatively high, locally confined impact effect, a local overloading of the bumper system may occur, with the result that components which can no longer be regenerated have to be exchanged.

- The present invention seeks to provide a vehicle bumper arrangement which is able to increase decisively the regenerateable impact absorbcency of the bumper, while retaining the pedestrian-protective flexible design of the cover and of the skirt.

- According to the invention, there is provided a bumper for a motor vehicle comprising an impact-near and an impact-remote layer with a support part separating the layers from each other and supporting said layers by means of resilient holders on a support fixed to the vehicle, each of the layers consisting of an energy-absorbing foam, the support part having a panelling covering the front of the impact-near layer fixed thereto and to the lower side of which a skirt adjoins, wherein the support part is constructed as a rigid load distributing support and the panelling fastened to it merges integrally with the skirt.

- Owing to the fact that the support part now no longer undertakes any panelling function, its supporting capacity can be easily adapted to requirements by corresponding material selection and dimensioning. Due to the detachment in terms of force of the cover and the skirt from the support part, there is also freedom with respect to defining the characteristics for the obtainment of a pedestrian-protective design of the front bumper finish.

- In a further development of the invention, rigid attachments are fixed on the support part, which serve for example the purpose of receiving fog lamps in a protective arrangement.

In order to achieve an adaptation of the section modulus to the stresses to be ex-

ing strength, the support part is provided with a reinforcement in the region between the front holders.

- Relative movements between the two foam layers and the assigned supporting walls are prevented in all possible direction of impact if the support part or the support part and the reinforcement accommodate the two layers of energy-absorbing foam securely against displacement.

An embodiment of the invention will now be described in more detail below and with reference to the accompanying drawings, in which:—

- Figure 1 shows a simplified plan view of a front bumper arrangement,

Figure 2 shows the section along the line II-II in Fig. 1, and

- Figure 3 shows the section along the line III-III in Fig. 1.

- The bumper illustrated in Fig. 1 consists of a laterally wrapped-around panelling 1 of a viscoplastic material, which merges with a downwardly extending skirt 2 towards the bottom. The panelling 1 is fixed in a way described later to a substantially flexurely stiff support part 3, which is supported by means of front flexibly compliant holders 4 on a support 6 fixed to the vehicle and connected to the two front chassis members 5. Likewise flexibly compliant holders 7 hold the wrapped-round end regions of the panelling 1 at a distance from the vehicle bodywork (not shown).

- As Figs. 2 and 3 show, the enclosed space between the panelling 1 and the support part 3 is lined as far as possible with a first layer 8 of energy-absorbing foam. A second layer 9, likewise of energy-absorbing foam, follows on from the holder 4 and provides a two-dimensional support for the support part 3 against the support 6.

- The connection of the panelling 1 with the support part 3 is performed as shown in Fig. 2 by means of lower clip connections 10 and upper clip connections 11, which are arranged at regular intervals along the length over which the support part 3 extends.

- As illustrated in Fig. 3, rigid attachments 12, such as holders of additional lamps 13, may be fastened to the support part 3, the skirt 2 being provided with an aperture 14 at the assigned place in each case for light to pass through.

- As indicated by dot-dashed lines in Figs. 1 and 2, in order to increase the section modulus of the support part 3 in the region between the two holders 4, which is particularly stressed in a substantially central collision, a reinforcement 15 positively connected to said support part be fitted in addition.

- It can be seen further from Fig. 2 that brackets 16 are provided on the support part 3 and on the reinforcement 15 for supporting the first layer 8 and the second layer securely

and on the reinforcement 15, respectively. These brackets 16 may be moulded out or fixed on. In another way, not shown, it is also possible for supporting securely against displacement to fix the layers 8 and 9 adhesively on the support part 3 and on the reinforcement 15.

#### CLAIMS

- 10 1. A bumper for a motor vehicle comprising an impact-near and an impact-remote layer with a support part separating the layers from each other and supporting said layers by means of resilient holders on a support fixed  
15 to the vehicle, each of the layers consisting of an energy-absorbing foam, the support part having a panelling covering the front of the impact-near layer fixed thereto and to the lower side of which a skirt adjoins, wherein  
20 the support part is constructed as a rigid load distributing support and the pannelling fastened to it merges integrally with the skirt.
2. A bumper according to claim 1, wherein rigid attachments are fixed on the support  
25 part.
3. A bumper according to claim 1 or claim 2, wherein the support part is provided with a reinforcement in the region between the front holders.
- 30 4. A bumper according to claim 3, wherein the support part, or the support part and the reinforcement accommodate the two layers of energy-absorbing foam securely against displacement.
- 35 5. A bumper for a motor vehicle, substantially as hereinbefore described and with reference to the accompanying drawings.